

WHAT IS CLAIMED:

1. An electrosurgical instrument for sealing tissue, comprising:
a housing having a shaft attached thereto; and
an end effector assembly attached to a distal end of the shaft, the end effector assembly including first and second jaw members attached thereto, the jaw members being movable relative to one another from a first position for approximating tissue to at least one additional position for grasping tissue therebetween;

each of the jaw members including an elastomeric material disposed on an inner facing tissue contacting surface thereof, each of the elastomeric materials including an electrode disposed therein, the electrodes being offset a distance X relative to one another such that when the jaw members are closed about the tissue and when the electrodes are activated, electrosurgical energy flows through the tissue in a generally coplanar manner relative to the tissue contacting surfaces.

2. The electrosurgical instrument of claim 1, wherein the elastomeric material is selected from the group consisting of at least one of the following materials: silicone, polyurethane, santoprene, nylon, syndiotactic polystyrene, Polybutylene Terephthalate (PBT), Polycarbonate (PC), Acrylonitrile Butadiene Styrene (ABS), Polyphthalamide (PPA), Polyimide, Polyethylene Terephthalate (PET), Polyamide-imide (PAI), Acrylic (PMMA), Polystyrene (PS and HIPS), Polyether

Sulfone (PES), Aliphatic Polyketone, Acetal (POM) Copolymer, Polyurethane (PU and TPU), Nylon with Polyphenylene-oxide dispersion and Acrylonitrile Styrene Acrylate.

3. The electrosurgical instrument of claim 1, wherein the offset distance X is in the range of about 0.005 inches to about 0.200 inches.

4. The electrosurgical instrument of claim 1, further comprising at least one sensor which provides information to a feedback circuit for regulating the electrosurgical energy through the tissue.

5. The electrosurgical instrument of claim 4, wherein the sensor measures at least one of tissue impedance, tissue temperature and tissue thickness.

6. The electrosurgical instrument of claim 1, wherein at least one of the jaw members includes means for regulating the distance X dependent upon tissue thickness or tissue type.

7. The electrosurgical instrument of claim 1, wherein at least one of the jaw members includes a plurality of electrodes across the width thereof and the electrosurgical instrument includes means for selecting one of the plurality of electrodes for electrically opposing the electrode disposed on the other of the jaw

members, wherein the means includes a sensor which measures at least one of tissue impedance, tissue temperature and tissue thickness.

8. The electrosurgical instrument of claim 1, wherein the compressible material has a comparative tracking index value of about 300 to about 600 volts.

9. The electrosurgical instrument of claim 1, wherein the electrodes are wire electrodes which project from the tissue contacting surfaces of the elastomeric material into contact with the tissue.

10. The electrosurgical instrument of claim 1, wherein the elastomeric material on each of the jaw members includes an electrode which is partially disposed therein.

11. The electrosurgical instrument of claim 10, wherein upon grasping of tissue between the jaw members, each of the electrodes deflect inwardly relative to the tissue contacting surfaces.

12. The electrosurgical instrument of claim 11, wherein the electrodes are recessed within the elastomeric material.

13. The electrosurgical instrument of claim 12, wherein the tissue contacting surface of each electrode is substantially crowned.

14. An electrosurgical instrument for sealing tissue, comprising: /
- a housing having a shaft attached thereto; and
 - an end effector assembly attached to a distal end of the shaft, the end effector assembly including first and second jaw members attached thereto, the jaw members being movable relative to one another from a first position for approximating tissue to at least one additional position for grasping tissue therebetween;
 - each of the jaw members including an insulative material disposed on an inner facing tissue contacting surface thereof and an elastomeric material disposed between each jaw member and a respective insulative material, each of the insulative materials includes an electrode disposed therein, the electrodes being offset a distance X relative to one another such that when the jaw members are closed about the tissue and when the electrodes are activated, electrosurgical energy flows through the tissue in a generally coplanar manner relative to the tissue contacting surfaces.
15. The electrosurgical instrument of claim 14, wherein the offset distance X is in the range of about 0.005 inches to about 0.200 inches.
16. The electrosurgical instrument of claim 14, further comprising at least one sensor which provides information to a feedback circuit for regulating the electrosurgical energy through the tissue.

17. The electrosurgical instrument of claim 16, wherein the sensor measures at least one of tissue impedance, tissue temperature and tissue thickness.

18. The electrosurgical instrument of claim 14, wherein at least one of the jaw members includes a plurality of electrodes across the width thereof and the electrosurgical instrument includes means for selecting one of the plurality of electrodes for electrically opposing the electrode disposed on the other of the jaw members, wherein the means includes a sensor which measures at least one of tissue impedance, tissue temperature and tissue thickness.

19. The electrosurgical instrument of claim 14, wherein the insulative material on each of the jaw members includes an electrode which is partially disposed therein.

20. The electrosurgical instrument of claim 19, wherein the electrodes are recessed within the insulative material.